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MEASURING SUSTAINABLE DEVELOPMENT

APPLICATION OF THE GENUINE PROGRESS INDEX TO NEWFOUNDLAND & LABRADOR

THE ECONOMIC IMPACT OF SMOKE-FREE WORKPLACES:

AN ASSESSMENT FOR NEWFOUNDLAND & LABRADOR

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March 2003

PART III

IMPACT OF WORKPLACE SMOKING BANS ON RESTAURANT, BAR AND HOTEL SALES

4. Impacts of Workplace Smoke Bans on Business: Methods

Part Two demonstrates that the economic impacts of a workplace smoke ban must be assessed within a full-cost accounting framework that includes "externalities," or societal costs borne by the taxpayer and the economy as a whole. The most important of these costs are clearly those associated with the health impacts of tobacco smoke, and include both direct health care costs, and indirect economic losses due to premature death and disability. Because the health impacts of second-hand smoke are now well established, these costs cannot be ignored in any benefit-cost analysis of the proposed legislation.

In addition, the preceding analysis demonstrates that the primary focus of a workplace smoking ban must be on protection of those employees who are subjected to the highest rates of second-hand tobacco smoke exposure, particularly restaurant, bar and casino workers. Evidence that ETS levels in bars are 4 to 6 times higher than in offices and residences with smokers, and that food-service workers have a 50% excess lung cancer risk indicates that protection of patrons is not the only, or even primary, goal of the proposed legislation.

Indeed, the accumulation of evidence on the health impacts of ETS raises the spectre of legal liability for both businesses and government, which bear responsibility for the health and safety of employees at the work site. A recent British report notes: *"Workers in the hospitality industry have rights in common law, employment law, and health and safety law."* [169] The report noted that a U.K. casino croupier, backed by his union, is currently suing a casino for failing to provide protection against the harmful effects of environmental tobacco smoke.

In Australia, there have already been dozens of highly publicized workers' compensation cases involving exposure to second-hand smoke. In a precedent-setting case in 1992, a jury awarded $A85,000 to an asthmatic woman who took her employer to court arguing that her asthma had been aggravated by the tobacco smoke she was obliged to breathe at work. In 2001, an Australian bar worker was awarded over $A450,000 after developing throat cancer as a result of workplace exposure to second-hand smoke.[170] Australian surveys show that fear of litigation has now overtaken concern for workers' health as the main reason for introducing smoking bans.[171]

Clearly, therefore, business decisions, too, must be based on a wider cost-benefit analysis than sales alone, even if they do ignore externalities and social costs. It was noted in Part One that business impacts of smoke-free legislation include changes in employee productivity and absenteeism, maintenance and cleaning costs, operating and safety expenses, fire insurance premiums, customer and employee satisfaction, changes in the customer base, and potential litigation.

A 1996 Conference Board of Canada study accounting for some of these wider business impacts concluded that the evidence does *"not support the fear that going smoke-free would be detrimental overall for business."* [172]

Nevertheless, some members of the hospitality industry have, in the past, expressed fears that a workplace smoking ban would hurt restaurant and bar sales. This fear is considered to be the greatest impediment to a full work place smoking ban. It is noteworthy, however, that the Center for Hospitality Research at Cornell University's respected School of Hotel Administration has specifically responded to such claims in the past with the following unequivocal statement:

> *"At the very least restaurateurs should make business decisions based on data, not opinion. Ultimately, smoke-free legislation is likely to have a positive impact on restaurant industry revenues. Our advice to other cities and municipalities is to consider seriously similar legislation. The restaurant industry collectively may experience higher revenues through smoke-free legislation."*[173]

Thus, *even* if wider benefits and costs are ignored, which this report does not advocate, there is still a need to base narrower statements about the likely impacts of smoke-free legislation on sales revenues, hard data and evidence. Since the 1996 *Cornell Hotel and Restaurant Administration Quarterly* analysis of the impacts on restaurant revenues of New York City's Smoke-Free Air Act of April, 1995, there have been a number of other studies undertaken in various jurisdictions in the U.S. that have banned smoking in workplaces.

This report reviews the best available evidence to this point, and summarizes the results and conclusions of detailed studies conducted in California, Colorado, Massachusetts, New York, Arizona, Texas, Utah, Vermont, North Carolina, and British Columbia. The most objective and unbiased data sources for analysis of the economic impact of smoke bans on restaurant sales are official sales tax receipts spanning the period both before and after the legislation was passed, since these are both comprehensive and legally required.

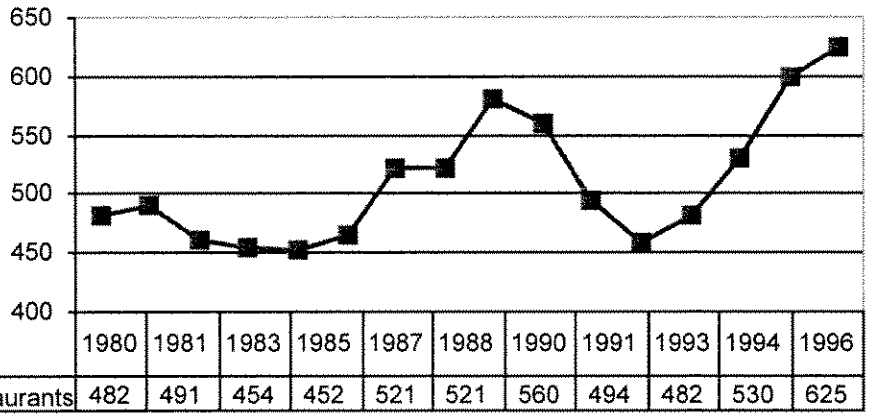
Sales tax data reflect *all* restaurant sales in a particular jurisdiction, not just those of a small sample, and they can be considered reasonably accurate since it is a crime to report fraudulent figures to the U.S. Internal Revenue Service. Sales tax data are also collected through consistent methods by government agencies with no interest in the effects of smoking restrictions on sales, and can therefore be considered unbiased. The data are also verifiable and easy to obtain from state or local taxation departments.[174]

For all these reasons, it has been concluded: "*Of all the methods used to assess the economic impact of smoke-free laws, many researchers believe the use of taxable sales data to be the best approach available.*"[175] In order to exclude any potential reporting bias, this report examines the results of all published studies based on these objective sales tax data.

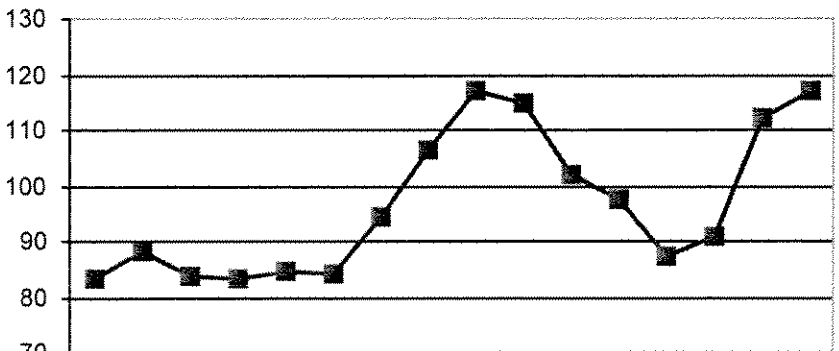
The best studies also control for possible fluctuations in the business cycle and for seasonal effects. This is done by (a) comparing restaurant, bar and hotel sales as a proportion of total retail sales before and after legislation; (b) comparing sales in jurisdictions with smoke-free legislation with sales in neighbouring and comparison jurisdictions without such legislation during identical months; (c) considering sufficiently long time periods; and (d) comparing identical months before and after legislation.

One study (5.8 below) further assesses revenue changes in particular locales against the economic health of the hotel and tourism industry at the national level. In order to control for general economic trends, seasonal effects and other factors that vary over time, these studies also use multivariate regression analysis that can remove the influence of such extraneous factors and facilitate an unbiased estimate of the particular effect of smoking restrictions on restaurant sales. The best studies use several different regression models and types of analysis in order to assess consistency in the results.

Figure 1: Restaurant and Take-Out Receipts, Nova Scotia, (1996$ millions)



	1980	1981	1983	1985	1987	1988	1990	1991	1993	1994	1996
Restaurants	482	491	454	452	521	521	560	494	482	530	625



	1980	1982	1983	1986	1987	1989	1991	1992	1994	1995
Take Out	83	84	83	84	94	117	102	97	91	112

Sources: Statistics Canada, *Restaurants, Caterers, Taverns Receipts,* no. M52, Nova Scotia, annual reports, adjusted to constant 1996$, using the Nova Scotia Consumer Price Index for "Food Purchased from Restaurants", Statistics Canada, CANSIM database 7466, P 803032.

These controls are essential because eating at restaurants is not a "necessity" and is therefore particularly sensitive to the business cycle and to prices.[176] The figure below indicates that expenditures on restaurant and take-out food fell during the recessions of the early 1980s and

1990s and recovered during each economic upturn.[177] Although the figure is based on Nova Scotia restaurant and take-out receipts, the general trend applies to NL.

Needless to say, changes in the tourist trade, seasonal fluctuations, and increased competition are other major factors influencing restaurant receipts. This indicates that it is important not to attribute changes in restaurant sales revenues to smoke-free legislation alone, but to account for seasonal, business cycle and other factors that can cause substantial fluctuations. For this reason, it is also necessary to supplement sales revenue data with survey data assessing whether patrons are dining out more or less often as a result of smoke-free legislation.

Finally, distinctions must also be made between short-term and long-term impacts. A *mandatory* smoke ban enforceable in law may have the immediate impact of discouraging smokers from dining out, while *voluntary* changes in behaviour may take longer to manifest. Since business investments and decisions assess profitability over the longer term, a sufficient time span must therefore be allowed to examine the impact of smoke-free legislation on business.

5. Impacts of Workplace Smoke Bans on Sales: Results

It is clear from the caveats above that simple-minded equations between smoke-free legislation and sales may potentially be misleading. The studies cited below are based on actual sales tax data, and they have all, to a greater or lesser extent, taken potentially confounding factors into account. The dates cited in the sub-headings refer to the date of publication of the studies themselves, not to the date of the smoke-free ordinances.

Based on an extensive literature search and review, the author believes the following summary to be a complete survey of *all* published studies that use taxable sales receipts to examine the economic effects of smoke-free restaurants. The results are also supplemented here with survey data to test the robustness of the results. Finally, an important survey before and after enactment of smoke-free legislation tested whether restaurant proprietors' initial concerns had been borne out by actual experience.

Some of the most comprehensive studies to date on the economic impacts of smoke-free legislation emanate from California, which has taken the lead in protecting its residents from tobacco smoke in public places and workplaces. Protection is now guaranteed by local ordinances (bylaws) in hundreds of towns and cities in the state, and the *1995 California Clean Air Act* provides statewide protection from second-hand smoke.

On January 1, 1998, that law was extended to cover bars and bar-restaurants. The *California Smokefree Indoor Workplace Law* now bans smoking in all workplaces including restaurants, bars and gaming clubs.[178]

5.1 San Luis Obispo Restaurants and Bars, California, 1993

One of the first systematic analyses of the economic impacts of anti-smoking ordinances on sales was conducted in San Luis Obispo, California, which, in August 1990, enacted one of the strictest ordinances in the U.S.A., banning smoking in all restaurants and bars in the city. Following the ban, a survey found 73.5% of City residents favoured the smoking ban, 23.5% were opposed; and 3% had no opinion.[179]

Sales tax analysis for the period April, 1985, to January, 1992, was conducted for the City by the Economic Forecast Project of the University of California at Santa Barbara. The study accounted for the effects of the general economic recession of the early 1990s by comparing San Luis Obispo restaurant and bar sales with those in other California jurisdictions that had not enacted anti-smoking ordinances. Additional patron and manager survey data were collected by the Taylor Consulting Group, a San Luis Obispo market research and public opinion polling firm.

The study concluded:

> *"The smoking ban appears to have no significant effects on the profitability of the restaurants and bars of San Luis Obispo. The ban has no measurable impact on restaurant and bar sales, as measured by sales tax revenues. This is true for both restaurants serving alcoholic beverages and those who do not. Furthermore, sales in neighbouring cities did not increase when the ban was instituted in San Luis Obispo."*[180]

The study also found no significant impact on tourism. The sales tax data were confirmed by a survey of 227 restaurant and bar patrons, which indicated that non-smokers were more likely to frequent restaurants and bars (16%) and smokers were less likely to do so (12%). As well, smokers were more often going to out-of-town establishments, while non-smokers were more likely to go to San Luis Obispo establishments. Overall, the study found, *"these two shifts offset one another such that there is no net sales impact."*[181]

A separate survey of restaurant and bar managers reported no significant cost savings or cost increases as a result of the ordinance, although some managers reported more employee smoke breaks, while others reported reduced costs for drapery and carpet cleaning. Overall, the study concluded, *"these cost impacts are not experienced widely enough to represent a measurable impact on the collective bottom line of San Luis Obispo restaurants and bars."*[182]

The results can be considered robust in that the study meets important methodological criteria outlined in the previous chapter. Sales tax data are analyzed over a long enough time frame to eliminate seasonal fluctuations; the effects of the business cycle are accounted for; some wider business costs and benefits are considered; and objective sales tax data are supplemented by both patron and manager surveys.

5.2 Restaurants and Bars, California and Colorado, 1992, 1994, and 1997

The most comprehensive analyses of sales tax data to date have been conducted by the Institute for Health Policy Studies in the Department of Medicine at the University of California in San Francisco. Three studies, in 1992, 1994 and 1997 successively updated the data to assess changes over time.[183] Sales tax data for 1986-1996 were supplied by the Research and Statistics Division of the California Board of Equalization and analyzed by the researchers using multiple regression.

The 1994 study compared restaurant sales in 15 California and Colorado cities with smoke-free ordinances with 15 demographically comparable cities that had not enacted ordinances, using sales data for 1986-1993. The study further accounted for business cycle fluctuations by examining restaurant sales as a fraction of total retail sales.

The 1997 study replicated the earlier one, adding three more years of data. The long time frame for the sales tax data analysis (11 years) accounts not only for seasonal and business cycle fluctuations, but tests the earlier results and allows long-term trends to be assessed with considerable accuracy.

All California bars have been smoke-free since January 1, 1998, but the 1997 analysis also examined sales tax data in five California cities and two counties that had previously enacted their own prohibitions on smoking in bars between 1990 and 1994. Sales tax data for the two counties were available from 1986-1996, and for the five cities from 1991-1996. At the time of the study, the bar ordinances had been in effect for between 25 and 65 months, allowing long-term impacts on sales to be assessed for bars as well as restaurants.

Both the 1994 and 1997 studies found the same results and came to exactly the same conclusion:

> *"Smoke-free ordinances do not adversely affect either restaurant or bar sales.... Ordinances had no significant effect on the fraction of total retail sales that went to eating and drinking places or on the ratio between sales in communities with ordinances and sales in comparison communities. Ordinances requiring smoke-free bars had no significant effect on the fraction of revenues going to eating and drinking places that serve all types of liquor....*
>
> *Legislators and government officials can enact health and safety regulations to protect patrons and employees in restaurants and bars from the toxins in secondhand tobacco smoke without fear of adverse economic consequences."*[184]

Citing California bar revenue data, an analysis published in *Tobacco Control* last year concluded that *"these data further discredit tobacco industry claims that smoke-free bar laws are bad for the bar business. Quite the contrary, these laws appear to be good for business."*[185]

These University of California studies were particularly significant because they explicitly tested undocumented claims by the tobacco industry and by tobacco industry-sponsored organizations that the first 100% smoke-free restaurant ordinances in California had produced a 30% drop in business.

Those organizations, including the Beverly Hills Restaurant Association (BHRA) and the California Business and Restaurant Alliance, were funded by the tobacco industry and created specifically to mobilize restaurants against smoke-free ordinances. According to the then-president of the BHRA, there was no Beverly Hills Restaurant Association before the smoke-free ordinance. He later testified that the organization had been set up by the tobacco industry for the specific purpose of fighting the legislation, and that the tobacco industry helped pay the organization's bills in a lawsuit against Beverly Hills.[186]

The tactics succeeded. Repeatedly using the undocumented allegation that business had suffered a 30% decline in revenues during the five months the smoke-free ordinance was in effect, the BHRA succeeded in having the Beverly Hills ordinance repealed in 1997. The same unsubstantiated argument succeeded in having the Bellflower anti-smoking ordinance repealed in 1992, and it has been frequently used by the Ontario Restaurant Association to oppose smoke-free by-laws in that province.[187]

The 1994 University of California study, using California State Board of Equalization sales tax data, included Beverly Hills and Bellflower in its analysis. The sales tax data demonstrated

clearly that the undocumented tobacco industry arguments were false and, in the case of Bellflower, actually the *reverse* of what was claimed:

1) In Beverly Hills, *no* drop in restaurant sales occurred following enactment of the ordinance, let alone the 30% drop claimed by the tobacco industry and its front organizations. In fact, there was a slight increase in restaurant sales during the five months the by-law was in effect.
2) When Beverly Hills repealed its ordinance four months after enactment, *no* increase in restaurant sales occurred following repeal. In fact neither the ordinance nor its repeal had any measurable impact on sales at all.
3) Although the Bellflower ordinance was repealed in 1992 because of claims that business had dropped, sales tax data demonstrated that the smoke-free ordinance was actually associated with a marginally significant *increase* in restaurant sales.
4) After the Bellflower smoke-free ordinance was repealed, restaurant sales dropped.[188]

Had the tobacco industry and "restaurant association" argument been true, an increase in sales would be expected following repeal of both ordinances. The hard evidence indicates that tobacco industry and associated claims have deliberately misled policy makers in the past, and that NL legislators should be highly suspicious of unsubstantiated claims that a workplace smoke ban will hurt business.

Since 1998, statewide California legislation has banned smoking in all workplaces including restaurants, bars and gaming clubs, so that local ordinances in that state are no longer the primary battle grounds in the tobacco industry's efforts to resist restrictions on second-hand smoke. Indeed, the California experience demonstrates the greater utility and efficiency of statewide legislation in avoiding costly local struggles.

5.3 Restaurants, California, 1994

A detailed 1994 study conducted by the Claremont Institute for Economic Policy Studies at the Claremont Graduate School tested the impact of smoke-free ordinances on restaurant sales within a framework designed to account for a wide range of *other* non-ordinance local and statewide economic determinants of restaurant revenue.[189] One specific study goal was to test the results of the 1994 Glantz and Smith investigation (5.2 above) by using a different econometric model, considering a much larger sample of cities, and accounting for possible confounding variables.

California State Board of Equalization restaurant taxable sales data from 1986 to 1992 were collected for 106 California cities ranging from those with complete smoke bans to those with stronger and weaker restrictions (60%-80% non-smoking, and 50% non-smoking seating respectively), to those with no restrictions. In addition, a random sample survey of 4,644 adults in eight California cities was conducted to assess public support for no-smoking policies in restaurants and other workplaces.

This survey design is particularly strong because it controls for a wide range of other economic determinants, including:

1) taxable restaurant sales in the quarter prior to enactment of smoke-free ordinances as measure of past economic performance of the local restaurant industry;
2) total citywide non-restaurant taxable sales as a measure of local economic activity;
3) the number of restaurants in each city as a measure of the restaurant industry size;
4) city population as a measure of the clientele base of restaurants;
5) county unemployment rates and statewide personal income as general economic indicators.

The study also tested for any evidence of shifts in restaurant patronage from cities with smoking restrictions to surrounding cities without such restrictions.

But perhaps the most important contribution of this study is its capacity to compare smoking restrictions of various strengths. The Claremont Institute results confirmed the Glantz and Smith conclusions:

- *"The study found ordinances had no systematic impact on restaurant revenues, regardless of the percentage of no-smoking seating required.*
- *Surrounding cities without ordinance restrictions exhibited patterns of effects that were indistinguishable from those of ordinance cities...."*[190]

Complete smoke bans, which are the only way to eliminate ETS from the work environment, did not impact restaurant sales any differently than weaker restrictions. This is supported by the associated survey results, which indicated that 81% of all respondents (and even 35% of smokers) supported a complete ban on smoking in restaurants.[191]

5.4 Restaurants, West Lake Hills, Texas, 1995

The previous studies were conducted by independent researchers. But a similar 1995 study in Texas was conducted by the Centers for Disease Control and Prevention (CDC) of the National Center for Chronic Disease Prevention and Health Promotion of the U.S. Department of Health and Human Services . The study, assessing the impact of a 100% smoke-free ordinance on restaurant sales in West Lake Hills, Texas, included all restaurants and restaurants with bar areas. Results were published first in the CDC's *Morbidity and Mortality Weekly Report,* and subsequently in the *Journal of the American Medical Association.*[192]

The significance of this study is that it carries the "official" imprimatur of the lead U.S. government agency in the field of public health, and that it takes particular care to establish the highest standards of methodological integrity. Indeed, its stated purpose is to assess the economic impact of smoke-free ordinances *"based on the most objective, scientific evidence available,"* and to provide *"a model for other local and state public agencies to consider when evaluating tobacco control programs."*[193]

The study is the methodological "state of the art" on this subject, and it contrasts its approach with reports of harm to business based on "anecdotal information," "restaurant owners' self-reports," and short-term tax data analyses that collect data for only one or two quarters following ordinance enactment.

By contrast, the West Lake Hills study used sales data validated by tax revenue reported by the Texas State Comptroller's office for the 17-month period prior to ordinance implementation and the 19-month period following implementation. The model employs multiple linear regression techniques to account for seasonal variations in sales and temporal economic trends.

The study found that *"the total sales of the restaurants did not decrease after implementation of the ordinance."*[194] Perhaps even more significantly, the CDC's editorial board confirmed the earlier findings described in Sections 5.1, 5.2 and 5.3 above and the methodologies on which those studies were based:

> *"The findings in this report are consistent with assessments using similar methods in other locations that have reported that the implementation of smoke-free ordinances has not been associated with adverse economic effects on restaurants."*[195]

5.5 Restaurants and Bars, Massachusetts, 1997 and 2000

A 1997 study conducted by the Center for Health Economics Research for the Massachusetts Department of Public Health was the first to attempt a comprehensive analysis of the economic impact of smoke-free restaurant ordinances in an entire U.S. state.[196] These results are therefore of particular interest to NL lawmakers, as they are considering legislation for the province as a whole, as opposed to municipal councils that govern smaller jurisdictions.

The Massachusetts study allowed the first systematic state-wide comparison of towns that adopted highly restrictive policies with those that adopted weak restrictions or none at all. Highly restrictive ordinances were classified as those that either completely eliminated smoking in restaurants, or that confined smoking entirely to separate, enclosed, and separately ventilated sections. Weak restrictions are defined as those designating a percentage of seats non-smoking.

The researchers identified the smoking status of Massachusetts' towns and cities representing 98% of the state's population. The only jurisdictions omitted from the study were those that had not reported their smoking status, that did not have complete sales tax records available for the period under consideration, or that had fewer than 10 restaurants, and where confidentiality required the Massachusetts Department of Revenue to suppress data.

Inflation-adjusted taxable meal receipts data from the Department of Revenue were analyzed for 31 cities and towns that adopted highly restrictive smoke-free ordinances within a four-year time span from January 1992 through December, 1995, and for 222 control communities that had weak or non-existent restrictions. Data were analyzed for the six months immediately following adoption of a smoking ban, and for the same six-month period one year earlier, in order to control for seasonal fluctuations. Results were as follows:

> *"For the experimental communities as a whole [those adopting highly restrictive smoke-free ordinances], inflation-adjusted restaurant receipts were 5 percent greater in the six months following imposition of a smoke-free policy than in the same six months one year earlier, pre-ban. In contrast, there was virtually no*

change in sales in control communities that did not adopt smoke-free restrictions. The comparison of experimental and control communities indicates that adoption of highly-restrictive restaurant smoking policies led to an increase of about 5 percent in restaurant receipts in the six months following the imposition of the ban."[197]

These results are based on raw aggregate receipts data. The researchers then used multivariate analysis to estimate the average effect of smoke-free policies, controlling for seasonal and year effects, general economic trends, data collection methods, and other factors that vary over time across all towns. By removing the influence of these other factors, it is possible to obtain an unbiased estimate of the particular effect of smoking restrictions on restaurant sales. Three different regression models were used to assess whether results were consistent:

"All models indicate that smoke-free restaurant restrictions increased restaurant receipts in towns adopting smoke-free policies, by 5 to 9 percent. This is consistent with the descriptive results. The range of uncertainty of the estimates is 0-12 percent, indicating that the measured positive effect of smoking restrictions is unlikely to be due to random fluctuations (noise in the data). There is no support for the hypothesis that restaurant smoking restrictions reduced restaurant receipts."[198]

A separate study of aggregate meal tax receipts in Brookline, Massachusetts, confirmed these results and found that a smoke-free policy for all city restaurants and bars "*did not have a significant, immediate effect on the city's restaurant patronage.*"[199]

5.5.1 Massachusetts: Refinements in the 2000 Study Update

These data, results and conclusions were updated and confirmed by the authors in a November, 2000 final report submitted to the Massachusetts Department of Public Health.[200] The update, which analyzed three additional years of data (through 1998), was necessary because the profile of Massachusetts cities and towns with smoke-free ordinances has changed dramatically in recent years.

By April, 1999, 153 cities and towns, representing two-thirds of the state's population, had restricted smoking in restaurants, including 75 which either completely prohibit smoking in restaurants, or impose severe restrictions such as requiring separate, enclosed and separately ventilated smoking rooms. The update therefore allowed analysis of a considerably larger group of communities with smoke-free legislation over a longer period of time.

In addition, the update separately analyzed alcohol-serving establishments, including restaurants, bar sections of restaurants, and free-standing bars, the most comprehensive sales tax study to do so systematically. These results are particularly interesting because smoke-free policies have been assumed to affect alcohol-serving establishments disproportionately because of the apparent correlation between the consumption of alcohol and tobacco.

Because the Massachusetts Department of Revenue does not release data for communities with fewer than 10 restaurants in order to protect confidentiality, and because there are fewer communities with at least 10 alcohol-serving establishments, the alcohol-serving analysis included data from 79 communities, compared to 239 for the full restaurant analysis.

Given the 10-restaurant minimum, the full analysis included 60 Massachusetts cities and towns that had adopted highly restrictive smoking policies between January 1992 and December 1998, and 179 communities that either had no restrictions or weak ones simply designating a portion of seats as non-smoking. For alcohol-serving establishments, the study analyzed 22 communities with strong restrictions and 57 without such restrictions.

The update also went beyond the earlier 1997 study by analyzing trends in highly restrictive towns that were surrounded by communities without smoking restrictions, compared to highly restrictive towns surrounded by other highly restrictive towns. This additional variable was designed to test whether smokers might migrate to communities with less restrictive policies, thus adversely affecting restaurant sales in the highly restrictive communities.

The analysis found that per capita meals receipts for alcohol-serving establishments in communities with strong smoking restrictions grew between 1992 and 1998 at almost twice the rate of those in communities without such restrictions. For all restaurants, there was no significant difference in the trend lines, though towns with strong smoking restrictions saw a somewhat faster rate of growth in sales than towns without such restrictions.[201]

Regression analyses controlling for a range of seasonal, income and other economic variables and for the extent of smoking restriction were conducted to assess the degree to which these trends could be attributed to smoke-free policies.

The sample size was also large enough to conduct a sensitivity analysis that separated out, from the 60 communities with highly restrictive policies, twelve that may not have completely eliminated the presence of second-hand smoke from non-smoking sections. It was therefore possible to test whether a complete prohibition of smoking in restaurants, including bar sections of restaurants, had a different economic impact than allowing smoking in bar sections only with a buffer zone.

The results of all analyses confirmed the conclusions of the 1997 study:

> *"Our findings indicate that highly restrictive restaurant smoking policies do not have a statistically significant effect on a community's level of meals receipts. Controlling for other less restrictive restaurant smoking policies did not change our findings. Similarly, analyzing data for only those establishments that served alcoholic beverages generated a similar set of results.*
>
> *While restaurants in Massachusetts experienced an overall increase in revenue between 1992 and 1998, the local adoption of restaurant smoking policies did not lead to a measurable deviation from this strong positive trend.... Results of our sensitivity analysis were consistent with our main findings. Across all models, the*

implementation of a highly restrictive restaurant smoking policy did not have a significant effect on restaurant sales."[202]

The authors speculate that a reason for the null finding may be that smokers are not sufficiently inconvenienced by smoke-free policies to alter their demand for restaurant meals substantially, or that non-smokers may increase their demand for restaurant meals, thus offsetting any reduction in sales among smokers. These hypotheses will be tested in survey material presented in the next chapter.

The 2000 Massachusetts study also found that towns that were completely surrounded by other towns with highly restrictive restaurant smoking policies had an average of 7.9% higher monthly per capita restaurant sales than those surrounded by towns without highly restrictive policies. However, regression analysis controlling for economic, seasonal and other variables found that the portion of border towns with or without highly restrictive policies *"failed to have a statistically significant effect on meals receipts (among all establishments and the subset of alcohol-serving places)."*[203]

5.6. Restaurants, Hotels and Motels, Arizona, 1998

In June 1993, Flagstaff became the first city in Arizona to prohibit smoking. This provided an excellent opportunity to compare the economic impact of the ban with six different no-intervention comparison areas in Arizona at the city, county and state levels. Following the methods and procedures in the studies described above, taxable restaurant sales and total retail sales data were collected for a five year period, from 3.5 years prior to enactment of the smoke-free ordinance in Flagstaff to 1.5 years afterwards.[204]

The results are significant because this is the first published study to use the same methods validated by the U.S. Centers for Disease Control (5.4 above) to include tourism impacts explicitly, and to assess the impact of a smoke-free ordinance on hotel and motel sales.

Account was taken of population size and increase, tourism impacts, and overall economic trends. For all seven comparisons, four separate analyses were conducted:

1) comparison of restaurant sales before and after enactment of the no-smoking ordinance;
2) comparison of ratios of Flagstaff restaurant sales to comparison areas before and after enactment of the ordinance;
3) comparison of ratios of Flagstaff restaurant sales to Flagstaff retails sales before and after enactment of the ordinance;
4) comparison of motel/hotel sales before and after enactment of the no-smoking ordinance.

"All analyses resulted in the same conclusions: prohibiting smoking in restaurants did not affect restaurant sales....If prohibiting smoking in restaurants had a negative effect on restaurant sales, one would expect that at least one of the analyses would show a significant difference. However, none of the analyses conducted found that the ordinance had either a positive or a negative effect on

restaurant sales.... Since businesses are legally required to report accurate data, the investigators knew of no other way to collect more accurate data." [205]

No significant changes in trends were found in the comparison of motel and hotel sales, indicating that the no-smoking prohibition had no discernible impact on tourism. The researchers explicitly confirmed the previous studies and findings described in sections 5.1, 5.2, 5.3 and 5.4 above, that *"smoke-free ordinances did not adversely affect restaurant sales."*[206]

The authors also compared their results with an earlier voluntary Flagstaff by-law, in order to assess a standard tobacco industry argument that restaurants and bars should be given a choice of whether to allow or prohibit smoking. Given the choice, that analysis found that 82% of restaurateurs chose to allow smoking. The researchers concluded that voluntary policies are *"unlikely to prevent exposure of restaurant patrons and employees to environmental tobacco smoke."*[207]

Based on the accumulated evidence and the consistency of results, the Northern Arizona University researchers provide direct advice to other communities:

> *"The accumulating evidence associating passive smoking with health risks indicates a need for stronger efforts to protect nonsmokers from exposure to tobacco smoke.... Local governments contemplating the adoption of smoke-free legislation should note that this study found that prohibiting smoking in city restaurants had no effect on restaurant sales.... If these [and other] findings are true for communities throughout the United States, then other cities can enact similar laws, which protect restaurant patrons and food service workers from tobacco smoke, without concerns that restaurants will lose business."*[208]

5.7 Restaurants and Hotels, New York City, 1999

In April, 1995, New York City's Smoke-Free Air Act prohibited smoking in the indoor dining area of restaurants with more than 35 seats and in most other indoor public places. Research scientists analyzed taxable sales data for eating and drinking establishments, hotels, and the retail trade for each county in New York State from March 1990 to February 1997 in order to determine the economic impact of the legislation on the city's restaurant and hotel industries.[209] Data were obtained from the New York State Department of Taxation and Finance.

The study combines the strengths of several earlier studies. The analysis of data for all 62 counties in the state shares the comprehensiveness of the Massachusetts study (5.5 above), and allows a comparison of sales trends in the five smoke-free New York City counties with the 55 state counties that had no smoke-free restaurant law.[210] Like the Flagstaff study (5.6 above), the researchers included taxable sales data from hotels as well as restaurants, but were able for the first time to analyze comparative hotel sales data on a state-wide basis.

As in earlier studies, the total retail sales data and the long (seven-year) time span of the data set account for seasonal, business cycle and other economic fluctuations. All values are adjusted for

inflation. A multivariate linear regression of each of five outcome measures further controlled for time, season and unemployment rates.

The results for each of the five outcome measures are as follows:

- Compared with levels two years earlier, real taxable sales from eating and drinking establishments increased by 2.1% in New York City after the Smoke-Free Air Act took effect and decreased by 3.8% in the rest of the state, where smoke-free ordinances were not in effect.

- Real taxable sales from hotels increased sharply by 36.9% in New York City after the Act, and by 2.4% in the rest of the state. Both New York City and New York State hotel sales in the two years prior to the Act had been almost flat.

- The ratio of taxable restaurant sales to total retail sales in New York City remained nearly constant over time at about 24%.

- The ratio of taxable restaurant sales in New York City to taxable restaurant sales in the rest of the state increased from 86% to more than 100%.

- The ratio of hotel revenue in New York City to hotel revenue in the rest of the state doubled from about 120% to 240%.

- The multivariate linear regression for each of these five outcome measures confirmed that the smoke-free ordinance was not significantly associated with sales for eating and drinking establishments or hotels, regardless of the outcome measure used.

> *"Based on these data, it can be concluded that the smoke-free law did not harm the restaurant industry in New York City. Further, no evidence was found that the hotel industry has been adversely affected by the smoke-free legislation.... Based on the findings from this study and the weight of evidence from the literature, the authors conclude the smoke-free law was not detrimental to the restaurant or hotel industries in New York City."*[211]

Other data sources on industry health confirm the findings based on sales tax data, and reveal no evidence that the Smoke-Free Air Act had any adverse economic impacts:

- Restaurant openings far outpaced restaurant closings in 1995, 1996 and 1997.
- Restaurant employment increased by 18% between 1993 and 1997, with 19,347 jobs added, compared to only a 5% increase in the rest of New York State where smoke-free ordinances did not exist.[212]
- The 1996 Zagat NYC Restaurant Survey, a standard hospitality industry survey covering over 1,800 restaurants, reported that eating out was up 22% from the previous year and the highest weekly pace recorded in over a decade.[213]
- Per meal spending was also up 1.5% in 1996, and inflation-adjusted per-meal restaurant spending remained relatively constant from 1995 to 1997.
- New York City hotel occupancy rates increased from 78.5% in 1995 to 81% in 1997.

- New York City tourism spending in 1997 was $500 million more than the previous year.
- A survey of New York City restaurant owners and managers found that small restaurants and bars exempted from the smoke-free law reported similar sales trends compared with places affected by the law.[214]

Just as Glantz and Smith used sales tax data to disprove unsubstantiated tobacco industry claims of a drop in restaurant sales in California, which led the cities of Beverly Hills and Bellflower to repeal smoke-free legislation (5.2 above), so this New York study disproved similar undocumented claims in that state.

A New York organization called the Empire State Tavern and Restaurant Association produced a study alleging a loss of jobs following implementation of New York City's smoke-free legislation. Further investigation showed that the alleged job losses in fact occurred *before* the New York City ordinance was implemented.[215]

The proliferation of such unsupported claims by the tobacco industry and affiliated organizations in their efforts to influence policy makers, indicates the vital importance of these objective and verifiable studies based on official sales tax data. In this case the provision of accurate and comprehensive information to lawmakers can literally save hundreds of lives in NL.

5.8 Tourism and Hotel Revenues in 6 U.S. States, 1999

As noted above, the tobacco industry and its affiliated organizations have frequently claimed that smoke-free ordinances would adversely affect tourism and hotel sales, and would discourage conventions. Europeans, in particular, are said to want their smoking rights.

For example, a tobacco industry front group called the United Restaurant, Hotel, Tavern Association of New York (URHTA) warned the city in 1994: *"New York stands to lose millions of dollars as meetings and conventions that bring visitors from all over the world take their business and vacations elsewhere."*[216] It later emerged the URHTA was funded by the tobacco industry and had no active chapter in New York City. As noted above (5.7), New York City hotels experienced a tourism boom following the Smoke-Free Air Act, with sharply increased sales and occupancy rates.

No documentation has been offered for these tobacco industry assertions. Because of the importance of tourism for the economy, however, this claim is worth particularly thorough investigation.

The Flagstaff and New York studies (5.5 and 5.6 above) were the first to test these unsubstantiated claims in particular locales. The first found no impact on tourism or hotel/motel sales; the second found a substantial increase in hotel sales following the smoke-free law. In 1998, The Institute for Health Policy Studies in the Department of Medicine at the University of California, San Francisco, systematically tested the tobacco industry assertions in every jurisdiction in the United States where the claim of adverse effects on tourism had been made.[217]

The researchers found three states (California, Utah and Vermont) and 6 cities (Boulder, Colorado; Flagstaff and Mesa, Arizona; New York, NY; and San Francisco and Los Angeles, California) in the USA where the effect on tourism of 100% smoke-free restaurant ordinances had been debated. This is the only study that focuses comprehensively and systematically on tourism impacts alone, and which covers a wide range of geographic locations and different types of tourist destinations.

As noted in the methodological observations in chapter 4 above, a valid study will account for underlying economic conditions, inflation, and the overall health of the tourism industry. This is accomplished in the University of California study by using constant 1997 dollars to analyze hotel and hotel room revenues in the study localities before and after ordinance enactment both as a fraction of total retail sales, and also by comparison with hotel revenues for the entire United States. Tourism flows from Europe and Japan were also analyzed. Official sales tax, tourism, national accounts and consumer price index data were used as sources.[218]

The study found that, taken together, "*the ordinances had no significant effect, one way or the other, on tourist revenues as a fraction of total retail sales or compared with the rate of change in the United States as a whole.... International tourism was either unaffected or increased following implementation of the smoke-free ordinances.*"[219]

Analyzed separately, the results showed a significant increase in the rate of change of hotel revenues following smoke-free legislation in four out of the nine localities, no significant change in four localities, and a slowing in the rate of increase (but not a decrease) in only one locality. The authors concluded:

> *"This study debunks the tobacco industry allegation that smoke-free restaurant laws adversely affect tourism, including international tourism.... Contrary to industry claims, these ordinances were not associated with significant drops in tourism. Quite the contrary, in several locales the ordinances were associated with significant increases in tourism.... Smoke-free restaurant ordinances did not hurt, and may have helped, international tourism....*
>
> *Food-service workers enjoy the least protection from secondhand smoke of any employee group. Legislators and government officials can enact such health and safety requirements to protect patrons and employees in restaurants from the toxins in secondhand tobacco smoke without the fear of adverse effects on tourism. Indeed, these ordinances may even be beneficial for business.*"[220]

5.9 Conclusions of All Studies

One other study has been found that analyzes long-term sales tax data, interestingly enough from the leading tobacco-producing state in the U.S. The study examined restaurant sales data from 1990 to 1997 for 10 counties in North Carolina to assess whether no-smoking regulations in some counties had adversely affected restaurant sales.[221]

The study found that the 10 counties experienced similar sales patterns and found no statistically significant impacts due to smoke-free ordinances. The researchers concluded that smoking restrictions and smoke-free ordinances do not affect restaurant sales and have no adverse impact on restaurant business.

The studies cited above are, as far as the author can determine, a complete listing of all published studies that use objective sales tax data to assess the longer-term economic impacts of smoke-free ordinances on restaurant, bar and hotel sales. The studies span a decade and a wide range of geographical locations in eight different U.S. states. They use a broad range of controls that account for seasonal, employment, and business cycle fluctuations. There is no selectivity or bias either in the choice of studies examined or in the data selection methods of the studies themselves.

Without exception, *all* the studies come to the same unequivocal conclusion: Smoke-free legislation has no adverse impact on business. Some studies find that smoke bans may possibly have a positive impact, but none find evidence of any negative impact. It is therefore proven beyond any reasonable doubt that smoking bans do not adversely affect aggregate restaurant, bar and hotel sales. Indeed, the probability that every published study analyzing verifiable sales tax receipts could be wrong is close to zero.

Other recent surveys of the available evidence come to the same conclusion:

> *"All the empirical evidence supports the proposition that smoke-free restaurant ordinances do not hurt the restaurant business."*[222]

> *"The conclusion of **all** published studies that used tax data in the analysis is that smoking restrictions do not impact negatively on hospitality sales and/or on employment nor on tourism activity in the long run.... The results generally are unequivocal in that the statistics indicate no negative impact on the proportion of consumer spending in restaurants."*[223]

Another comprehensive review of the evidence concurs:

> *"In one study after another, covering multiple states within the US, analysts have found no adverse effect of smoking restrictions, including complete bans, on local restaurants' business. Indeed, several of the studies have found a tendency for smoking restrictions to increase business. Similar findings derive from analysis of the effects of smoking restrictions on bars (presumed the smoker's sacred territory) and of the impacts of restaurant and bar restrictions on tourism."*[224]

The analysis notes that industry challenges to these data *"have never themselves involved empirical analysis of objective experience."*[225]

Nevertheless, a caveat must be added here. All the above studies review *aggregate* sales tax data over a reasonably long time period, and may therefore conceal short-term changes and differential trends among different types of restaurants. In order to investigate these possibilities,

the following chapter briefly reviews a range of other studies on the economic impact of smoke-free legislation, including patron surveys, that are helpful in disaggregating some of the results cited above, and providing more detail on trends within the restaurant industry itself.

5.10 Predicted Impacts on Newfoundland & Labrador Tourism Flows

Many of the dire predicted impacts of a smoking ban relate to tourism flows from Asia and Europe. For example, the president of the Hotel Association of Canada, which received $3.2 million from the Canadian Tobacco Manufacturers' Council to operate its "Courtesy of Choice" campaign,[226] stated that many tourists, particularly those from Europe and Asia, will not come to a place where they cannot smoke:

> *"By the year 2005, two-thirds of all global travel will emanate from Asia. People there smoke a lot. If they can't do something they do every day, then immediately we're putting up another barrier."*[227]

However, the *actual* tourism flows to NL do not support these predictions. The vast majority of visitors to the NL are from other parts of Canada. American visitors account for the second largest group of tourists. Overseas visitors likely account for less than 5% of the visitors to NL.[228]

A Philip Morris Incorporated survey of 1,000 smokers in each of 10 European countries found that smokers in every one of these countries were *more* accepting of smoke-free regulations than Americans, with most continuing to eat out just as frequently when smoke-free restaurant ordinances were in effect.[229]

Given actual tourism flows and tourist behaviour patterns, combined with the evidence in this chapter that smoke-free legislation in the U.S. has no adverse impact on hotel sales and tourism revenues, there is, therefore, no empirical support for the prediction that a smoke ban will harm tourism in NL.

Indeed, none of those predictions has assessed the likely *increase* in hospitality industry patronage by the vast majority of non-smoking tourists, many of whom consciously avoid smoky places. Survey evidence on that subject is assessed in the next chapter. There is an opportunity to promote and market NL as a healthy, visionary, smoke-free province.

6. Other Economic Impact Studies

Two other studies were found that use sales tax data to examine (a) short-term trends for the first 2-3 months following smoke-free legislation, and (b) certain *types* of sales. In addition, patron survey data has assessed trends *within* the restaurant industry that may result from smoke-free legislation, and that can provide important marketing information to restaurateurs on how they may adapt to a changing client base.

None of those studies invalidate the clear conclusion that smoke-free legislation has no overall adverse impact on business. But they do provide a level of detail that the aggregate long-term sales data cannot provide, and they can help facilitate the transition to smoke-free workplaces that better protect the health of employees and patrons alike and assist owners and managers in making market adjustments.

6.1 Short Term Sales: Mesa, Arizona, (1996) and British Columbia (2001)

A preliminary analysis of the short-term impacts of smoke-free legislation on selected businesses in Mesa, Arizona, was conducted in 1996 for the two months following enactment of the ordinance. The investigators found that selected categories of restaurants experienced a 4% actual sales decrease (6% adjusted decrease) over the two-month period compared to sales data from the same two months in the previous year.[230]

The investigators noted that two months was not an adequate length of time to make a judgement about the sales impact of the smoke-free ordinance, and that further study of longer-term data was required. Glantz and Charlesworth's longer-term analysis of tourism and hotel revenues (5.8 above) found that Mesa's smoke-free ordinance had no adverse impacts on hotel sales in Mesa, either in total revenues, as a fraction of total retail sales, or as fraction of national hotel revenues.[231]

In 1998, the Workers' Compensation Board (WCB) in British Columbia banned smoking in most workplaces, and provided protection from ETS exposure to 85% of B.C. workers. The rules were implemented with little problem and widely respected.

On January 1, 2000, the WCB extended its workplace smoking restrictions to include all hospitality and public entertainment facilities in the province, including all restaurants, bars, cabarets, games rooms, sporting arenas and bingo halls. The rationale was that the WCB is responsible for the occupational health and safety of *all* workplaces, and that *all* workers are therefore entitled to protection from environmental tobacco smoke regardless of their place of work.

That amendment was overturned by a judge on March 22, 2000, pending more public consultations. Following the public consultations, the WCB reintroduced the regulations that extend full protection from second-hand smoke to the remaining 15% of B.C. workers. The new amendments, which ban smoking in all hospitality and entertainment facilities including bars and restaurants in the province, came into effect April, 2002.

Pacific Analytics examined the impact of the smoking restrictions between January 1, 2000, and March 22, 2000, on liquor purchases only. Food sales, the dominant revenue source for restaurants, were not examined. The study frankly acknowledged that *"the behaviour of restaurant, cabaret and pub patrons in the short run could differ from their long-term behaviour,"* and that longer-term actions might result in a return to previous behaviour patterns.[232]

Pacific Analytics found that:

- Total January liquor purchases declined by 12.3%; February purchases declined by 4.9%; and March purchases increased by 8.2%;
- The WCB Amendment appeared to have a negative impact on hotel and pub alcohol purchases in January but not in February and March.
- Dining establishment liquor purchases declined 11.9% in January and 1.7% in February, but increased by 12.8% in March.
- Cabaret liquor purchases did not differ significantly in January and February, and increased by 11.3% in March.[233]

In sum, it appears that a complete ban on smoking in restaurants and bars reduces liquor sales in the first month after enactment, but that sales increase by the third month. These results are consistent with the short-term impacts observed in Mesa, Arizona.

These results are also logical, because a mandatory ban may *initially* discourage smokers from frequenting eating and drinking establishments, while voluntary changes of behaviour will take somewhat longer to manifest. Evidence presented below indicates that nonsmokers will begin frequenting restaurants and bars they previously avoided because of their smoky atmosphere and smokers will adjust to the new regulations. But that trend is likely to more gradual than the immediate impact of a mandatory prohibition.

What is remarkable in the B.C. study is how quickly the trends changed, with increases in liquor purchases recorded by the third month of the ban. If that increase is sustained over time as nonsmokers (the vast majority of the population) eat out more frequently, then the overall increase in sales may more than compensate for the very short-term temporary decline.

Again, it must be noted that the British Columbia study noted that the January 2000 decline in liquor purchases *"does not necessarily imply a decline in food sales, the dominant revenue source for Dining Establishments."*[234] In addition, it might be argued that, from a full-cost accounting perspective that includes road accident and other costs, a decline in liquor purchases, especially when consumed before driving, is not necessarily a negative phenomenon.

6.1.1 Longer Term Trends

In order to assess longer term trends, Pacific Analytic compared its January-March trends with data from Victoria and the Capital Regional District (CRD), where a no-smoking ordinance has been in effect since January, 1999. Again, the study found a short-term negative impact on liquor

purchases after the by-law came into effect. However, the long-term impacts were neutral for all types of liquor:

> *"Hence, once can conclude that within the CRD there are no long-term impacts associated with the no-smoking bylaw.... The statistical results strongly confirm that there are no long-term impacts from restrictive smoking regulations."*[235]

These results are independently confirmed by the B.C. Liquor Distribution Branch. As reported by the *Vancouver Sun* just nine months after Victoria's anti-smoking legislation came into force:

> ***Victoria drinks up despite tough smoking law:***
>
> *Pubs were supposed to close, patrons were supposed to stay home and booze sales were supposed to drop. But nine months after tough anti-smoking legislation was imposed in B.C.'s capital, business remains steady and liquor sales are up.... According to figures compiled by the Liquor Distribution Branch, booze sales at Victoria-area pubs, restaurants and hotels are up 1.7 per cent for the first nine months of the year over the same period last year.*[236]

The Pacific Analytics study further examined liquor sales in B.C. regions close to the Alberta and U.S. borders, in order to assess whether non-smoking regulations would impact competitiveness by prompting smokers to cross the border in order to dine and consume liquor. The study results indicated that:

> *"...there was no statistical difference in overall impacts as compared to the province as a whole. Consequently, we can say with confidence that being close to a border did not result in greater loss of business....The general conclusion is that the proposed amendment will not impact on BC's competitiveness in terms of customers frequenting out-of-province restaurants and bars."*[237]

A further regression equation for tourism in the Capital Regional District confirmed that:

> *"...long-run tourism activity in the CRD was not negatively affected by the introduction of the no-smoking bylaw. In conclusion, then, the statistics suggest that the introduction of the proposed amendment will cause neither a substantive dislocation of BC residents to drink and dine in Alberta and US facilities nor will there be an impact on tourist visits to BC."*[238]

The overall conclusion of the study is that non-smoking legislation would likely have some short-term negative impacts on liquor purchases, but that *"in the longer term, no measurable impact on either employment or sales would be likely."*[239]

Indeed, the actual results indicate that the short-term negative impacts on liquor sales are unlikely to exceed one month, and that third month liquor sales already show an increase over corresponding pre-ban sales. The adjustment period is, therefore, very short, and any initial slump is quickly compensated. No information is available on dining sales impacts in B.C.

[xviii] **Author:** Scollo, M., A. Lal, A. Hyland, and S. Glantz.
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REVIEW

Review of the quality of studies on the economic effects of smoke-free policies on the hospitality industry

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Objective: To compare the quality and funding source of studies concluding a negative economic impact of smoke-free policies in the hospitality industry to studies concluding no such negative impact.
Data sources: Researchers sought all studies produced before 31 August 2002. Articles published in scientific journals were located with Medline, Science Citation Index, Social Sciences Citation Index, Current Contents, PsychInfo, Econlit, and Healthstar. Unpublished studies were located from tobacco company websites and through internet searches.
Study selection: 97 studies that made statements about economic impact were included. 93% of the studies located met the selection criteria as determined by consensus between multiple reviewers.
Data extraction: Findings and characteristics of studies (apart from funding source) were classified independently by two researchers. A third assessor blind to both the objective of the present study and to funding source also classified each study.
Data synthesis: In studies concluding a negative impact, the odds of using a subjective outcome measure was 4.0 times (95% confidence interval (CI) 1.4 to 9.6; p = 0.007) and the odds of not being peer reviewed was 20 times (95% CI 2.6 to 166.7; p = 0.004) that of studies concluding no such negative impact. All of the studies concluding a negative impact were supported by the tobacco industry. 94% of the tobacco industry supported studies concluded a negative economic impact compared to none of the non-industry supported studies.
Conclusion: All of the best designed studies report no impact or a positive impact of smoke-free restaurant and bar laws on sales or employment. Policymakers can act to protect workers and patrons from the toxins in secondhand smoke confident in rejecting industry claims that there will be an adverse economic impact.

Smoke-free workplace policies reduce both exposure to secondhand tobacco smoke and cigarette consumption.[1–3] Smoke-free restaurants and bars similarly reduce exposure to tobacco smoke toxins among hospitality workers and patrons but also represent a serious business threat to the tobacco industry.

In California in 1987, a 100% smoke-free restaurant ordinance in Beverly Hills was rolled back, partly in response to claims that the ordinance was responsible for reducing restaurant revenues by 30%, claims which later turned out to be unsubstantiated.[4] Since then, tobacco companies and allied groups have routinely predicted that enactment of such legislation would severely impact restaurant and bar sales and employment.[5–9] Health advocates, by contrast, have presented studies indicating that no such adverse effects actually occurred.[10]

Policymakers are typically presented with a large amount of conflicting material, with evidence ranging from anecdotes about individual businesses[11] to scientific studies analysing objective information collected independently across an entire hospitality sector.[12] Such data are often confusing to interpret and it is difficult for policymakers to reach an evidence based conclusion. In their case study of deliberations by the Maryland Occupational Safety and Health Advisory Board, Montini *et al* demonstrate that those opposing proposed smoke-free workplace regulations lodged twice the number of submissions as those supporting it, but that evidence from opponents was substantially less scientifically rigorous than evidence provided by supporters of workplace smoking regulations.[13] Similar findings were observed in relation to the Californian Environmental Protection Agency's risk assessment of secondhand smoke,[14] and in Maryland and Washington hearings on proposed clean indoor air regulations.[15] Bero and her colleagues have repeatedly called on advocates to more forcefully draw to legislators' attention the superior scientific quality of the evidence base relied upon by public health groups in calling for clean air legislation.[13–15]

This paper compares the quality of evidence and conclusions about the economic impact of smoke-free laws on the hospitality industry based on the type of data used, how the studies are designed, analysed and interpreted, and the funding source.

METHODS

Data source

Studies included in this analysis are listed in a comprehensive summary produced by the VicHealth Centre for Tobacco Control.[16] Centre researchers attempted to locate all studies produced in English before 31 August 2002 that purported to assess the economic impact of smoke-free policies in the hospitality industry. Peer reviewed articles were located with Medline, Science Citation Index, Social Sciences Citation Index, Current Contents, PsychInfo, Econlit, and Healthstar using the terms smok* and restaurants, bars, hospitality, economic, regulation and law. Unpublished studies were also included in the analysis. These studies were located from a compilation by the Alberta Tobacco Control Centre,[16] by a request to members of the International Union Against Cancer's International Tobacco Control Network (GLOBALink), and an examination of hospitality industry websites and the websites of tobacco companies based in major English speaking countries, including the Philip Morris "Options" website, www.pmoptions.com . The researchers also conducted an internet search with the Google search engine www.google.com , using the terms "smok* bans" and "restaurants" or "bars", limited by the terms "economic impact" or "study".

Study selection

Studies included measured changes in sales, employment, numbers of establishments, bankruptcy data, public reports of intentions about or recent changes in patronage, spending or time spent dining, proprietors predictions or perceptions of sales changes and costs and estimated numbers of tourists. Studies were excluded where these made no explicit or implicit attempt to quantify the economic impact of smoking restrictions. Studies assessing opinions about smoke-free policy were included where the study included a question asking specifically whether people would attend venues more or less frequently were such policies to be introduced.

Ninety three per cent of the studies located (97/104) met the selection criteria as determined by consensus between multiple reviewers.

DATA EXTRACTION

Findings and characteristics of studies (apart from funding source) were classified independently by two researchers in most cases several months before the start of the study (MS and AL). Both assessors had tertiary qualifications in behavioural science and economics. A third assessor, (LH) a postgraduate psychology student blind to both the objective of the present study and to the funding source, also classified each study.

We used Siegel's criteria[12] to judge study quality: use of objective data (for example, tax receipts or employment statistics); inclusion of all data points after the law was implemented and several years before; use of regression or other statistical methods that control for secular trends and random fluctuation in the data; and appropriate control for overall economic trend. The more criteria a particular study met, the more certain one can be about the validity of results.

An outcome measure was deemed "objective" if it was based on data collected routinely by an independent agency covering the periods both before and after the smoke-free policy was in force. Objective measures included: sales figures provided for the purposes of taxation assessment; employment figures provided to government agencies generally for insurance purposes; and numbers of new or existing establishments based on business permit applications or registrations to the government agency that issues such permits, and bankruptcy data.

Unverifiable predictions of future changes or estimates of recent changes in patronage or spending were deemed "subjective". Subjective measures included anecdotal reports and self report data collected in polls of, or interviews with, patrons or owners of restaurants, bars or similar businesses, conducted either before or after the policy was put in place.

Another indicator of the quality of a study is whether it has been subject to peer review. The scientific quality of original research on secondhand smoke published in peer reviewed journals is superior to that in non-peer reviewed publications in terms of study design, reporting, and evaluation.[17] A study was deemed to have been peer reviewed if it was an article published in an academic journal.

Studies were classified as indicating or not indicating a negative economic effect based on their stated conclusions about the impact or potential impact on employment or profitability of the various sections of the hospitality industry at issue. All three raters agreed on the conclusions in all but one of the 97 studies. The Masotti study[18] was classified as negative, as per the conclusion of two of the three raters. Two studies[19 20] did not draw conclusions; we included them in the analysis based on their face-value findings.

Funding sources for each paper were noted after completion of all the other classification tasks. Funding was determined from acknowledgments in the studies (obscured on copies of papers classified by the third rater). When the source was not clearly disclosed, authors were contacted where possible and attempts were made to determine whether authors or sponsoring agencies had ever received financial support from a tobacco company or affiliated group. Searches were undertaken of previously secret tobacco industry documents made available as part of settlement agreements between tobacco companies the US attorneys general[21 22] (accessible through www.tobaccoarchives.com).

Analyses

We used contingency tables and odds ratios to compare studies concluding a negative impact with those not concluding a negative impact.

DATA SYNTHESIS

A total of 97 reports were located.[5 16–20 23–115]. Studies covered numerous local jurisdictions in 31 state or provincial areas, in eight countries. Thirty four of the studies examined the impact of smoke-free policies for drinking establishments, and 90 the impact of smoke-free policies for restaurants. Two studies examined the impact for recreational venues. One examined the impact of smoke-free restaurants on hotels and another on overall tourism.

Study quality

Of the 97 studies, 38% (37/97) used objective outcome measures and 25% (24/97) were peer reviewed. Twenty one studies met Siegel's four criteria for methodological quality, representing 57% (21/37) of the studies that used objective measures. By contrast, 98% (59/60) of the studies using only subjective outcome measures met none of the criteria. The odds of peer reviewed articles meeting all four criteria was 5.33 times that of non-peer reviewed studies (95% confidence interval (CI) 1.9 to 15.1; $p = 0.002$).

Funding source

Of the 97 studies, 32% (31) were funded either by the tobacco industry or a group known to have received funding from a tobacco company or tobacco industry ally.[19 20 23 37 59–61 80–83 86 96–97 103 107 108 114] Four studies did not disclose funding source, but were conducted by consultants or organisations known to have a connection with the tobacco industry.[18 31 58 85] For three of these studies, there was strong evidence of collaboration between tobacco companies and the study authors.[31 58 85]

The two studies by consultants where close ties with the tobacco industry had been established and those funded by organisations known to have received funding from the tobacco industry were included with the tobacco industry funded studies, yielding 31 tobacco industry supported studies. The funding source was treated as missing for six studies[18 27 99 104–106] because no data on funding source could be located.

The other 60 studies[5 24–26 28–30 32–56 62–79 98 100–102 109–113 115] were funded either by government, health related organisations or independent market research organisations.

All the studies used in this analysis is summarised in tables 1 and 2.

Study quality and funding

The methodological quality of the industry sponsored studies was significantly lower ($p < 0.001$) than the non-industry studies (table 3). Only one of the 31 tobacco industry supported studies (3%) has been published in a peer reviewed journal compared to 38% (23/60) of the non-industry funded studies. None (0/31) of the tobacco industry supported studies met all of Siegel's[12] four methodological quality criteria. Indeed, 84% (26/31) of the industry supported studies met none of the criteria. By contrast, 35% (21/60) of the studies not supported by the tobacco industry met all of Siegel's[12]

Table 1 Studies using objective measures to assess economic impact of smoke-free policies in the hospitality industry

	Control for economic conditions		Do not control for economic conditions	
	No effect, or positive effect	Negative effect	No effect, or positive effect	Negative effect
Studies funded from sources other than the tobacco industry				
Taxable sales receipts	Bartosch and Pope (1995)[34]; **Bartosch and Pope (1999)[35]**; Bialous and Glantz (1997)[36]; **Bartosch and Pope (2002)[98]**; Bialous and Glantz (1999)[5]; *Dresser (1999)[40]; **Glantz and Charlesworth (1999)[5]**; **Glantz and Smith (1994)[42]**; **Glantz and Smith (1997)[44]**; Glantz (2000)[43]; **Goldstein and Sobel (1998)[45]**; Haylett and Huang (2000)[30]; **Huang *et al* (1995)[46]**; ***Hyland *et al* (1999)[48]**; **Hyland (2002)[25]**; Maroney *et al* (1994)[51]; Pacific Analytics (2001)[52]; Pope and Bartosch (1997)[53]; **Sciacca and Ratliff (1998)[54]**; Styring (2001)[29]; Taylor Consulting (1993)[55]; **Wakefield *et al* (2002)[56]**		California State Board of Equalization (1998)[37]; *City of Boulder (1996)[38]; Fletcher (1998)[41]	
			*Dresser *et al* (1999)[39]	
Sales data other				
Employment levels	*Hild *et al* 2001[113]; ***Hyland and Cummings (1999)[47]**; *Hyland and Tuk (2001)[50]; **Hyland *et al* (2000)[49]**; Bourns and Malcomson[33]			
Number of establishments	***Hyland and Cummings (1999)[47]**			
Bankruptcy data	Bourns and Malcomson[33]			
Studies for which funding is unknown				Pubco 2002[27]
Sales data other				
Studies conducted by organisations or consultants with links to the tobacco industry around the time of the study				*Lilley *et al* (1996)[41] *Masotti *et al* (1991)[18]†
Taxable sales receipts				
Studies funded by tobacco companies or industry groups supported by the tobacco industry				*Laventhol *et al* (1990)[58]
Taxable sales receipts				Applied economics (1996)[57]
Sales data other				*Lilley *et al* (1999)[59]; *Lilley *et al* (1996)[60]
Employment levels				*Lilley *et al* 1999[59]
Number of establishments				

Bold type = peer reviewed.
*Use discrete rather than continuous data before and after the introduction of policies.
†Only weak evidence of connection with the tobacco industry.

criteria[5 25 30 33–36 42–46 48 49 51–56 98] ($p < 0.001$). Eleven of these non-industry funded studies have been published in peer reviewed journals.

Study quality and conclusion

Table 4 sets out the findings of those studies meeting each of various indicators of high quality: using objective outcome measures; meeting this and Siegel's other three criteria for quality; being funded by a source clearly independent of the tobacco industry; and being peer reviewed.

None of the 21 studies that met all four of Siegel's[12] quality criteria reported a negative impact (table 4). In fact, four of the studies report a positive impact on taxable sales receipts of restaurants, bars, hotels, or tourism.[5 36 45 48]

Only a handful of studies based on objective data conclude a negative impact. None of these meets more than one of Siegel's other three criteria for methodological quality. Only one peer reviewed study concluded a negative impact.[34] This study relied on subjective data and was funded by a tobacco company.

Table 5, conversely, shows, for those studies concluding negative impact, whether each of the various quality criteria was met. Once again, studies concluding a negative impact rarely included an objective measure and were almost never peer reviewed.

In studies concluding a negative impact, the odds of using only a subjective measure was 4.0 times (95% CI 1.4 to 9.9; $p = 0.007$) and the odds of being peer reviewed was 20 times (95% CI 2.6 to 166.7; $p = 0.004$) that of studies concluding no such negative impact (table 6)

Funding source and conclusion

There was a significant association of tobacco industry support with negative conclusions of the study ($p < 0.001$) (table 6). Ninety four per cent (29/31) of the tobacco industry supported studies concluded that there was or would be a negative economic impact of implementing a smoke-free policy. The odds ratio for a negative conclusion associated with tobacco industry support was infinite because none of the 60 non-industry funded studies concluded a negative economic impact.

DISCUSSION

Lower quality studies were much more likely to conclude smoke-free regulations adversely impact the hospitality industry, and weaker studies were much more likely to be

Table 2 Studies using subjective measures to assess the economic impact of smoke-free policies in the hospitality industry

	No effect or positive effect	Negative effect
Studies funded from sources other than the tobacco industry		
Public self reported intentions or actual patronage of restaurants/bars	Allen and Markham [2001][100]; August [2000][62]; **Biener and Fitzgerald [1999][83]**; **Biener and Siegel [1997][24]**; **Corsun et al [1996][63]**; Decima Research [2001][67]; Decima Research [2002][22]; Dresser *et al* [1999][39]; Field Research [1998][70]; Field Research [1997][69]; **Hyland and Cummings [1999][71]**; Lam [1995][73]; McGhee 2002 [24]; Miller and Kriven [2002][28]; Miller and Kriven [2002][26]; Shapiro 2001[112]; Styring [2001][29]; **Wakefield *et al* 1999**[101]	
Proprietor predictions/ perceptions of sales changes	Allen and Markham [2001][100]; **Cremieux and Oulette [2001]**[66]; Dresser *et al* [1999][39]; Edwards [2000][64]; Huron County Health Unit 1999[111]; **Hyland and Cummings[1999]**[72]‡; Jones *et al* [1999][115]; Markham and Tong [2001][74]; Parry *et al* [2001][76]; **Sciacca and Eckram [1993]**[75]; **Sciacca (1996)**[78]; **Stanwick (1998)**[77]; The Conference Board of Canada [1996][79]; Yorkshire Ash (2001)[102]	
Proprietor predictions/perceptions of cost	**Cremieux and Oulette (2001)**[66]; The Conference Board of Canada [1996][79]; Douglas County CHIP [2001][110]	
Estimated numbers of overseas visitors	Hodges and Maskill [2001][109]	
Studies for which funding source is unknown		
Proprietor predictions/ perceptions of sales changes		Economists Advisory Group [1998][105]; Pubco [2001][99]; The Publican [2001][106]
Studies conducted by organisations or consultants with some links to the tobacco industry around the time of the study		
Proprietor predictions/ perceptions of sales changes	Masotti *et al* [1991][18]†	CCG 1996[104]; Charlton Research [1994][83]
Studies funded by tobacco companies or industry groups supported by the tobacco industry		
Public self reported intentions or actual patronage of restaurants/bars	Auspoll [2000][19]; Decima research [1988][20]	Fabrizio *et al* [1995][107]; KPMG Barents [1997][23]; Marlow [1999][87]; National Restaurant Association [1993][91]; Sollars *et al* [1999][93]
Public self reported spending/time spent		Fabrizio *et al* [1995][107]; Martin Associates [1999][89]
Proprietor predictions/ perceptions of sales changes		Advantage Marketing Info [1997][80]; Applied Economics [1996][81]; CCG 1995[103]; Chamberlain Research Consultants [1998][82]; **Dunham and Marlow [2000]**[84]; EMRS 2001 [113]; Fabrizio *et al* [1996][108]; Gambee [1991][85]; KPMG Peat Marwick [1998][86]; KPMG [2001][21]; Marlow [1999][87]; Marlow [1998][88]; Mason-Dixon Market Research [1996][90]; Price Waterhouse LLP [1993][92]; Price Waterhouse LLP [1995][92]; Roper Starch [1996][94]; The Craig Group Inc [1998][96]; The Eppstein Group [1997][97]
Proprietor estimates of impact on employment		Advantage Marketing Info [1997][80]; Applied Economics [1996][81]; Fabrizio *et al* [1996][108]; Marlow [1998][88]; Price Waterhouse LLP [1993][92]; Roper Starch [1996][94]; Sollars *et al* [1999][93]; Chamberlain Research Consultants [1998][82]; The Eppstein Group [1997][97]
Proprietor predictions/perceptions of cost		Sollars et al [1999][93]

Bold type = peer reviewed; underline = study based on estimates of predicted changes rather than estimates of actual changes.
*Not a random survey.
†Only weak evidence of connection with the tobacco industry.
‡Control for economic trends.

funded by the tobacco industry. In addition, the industry studies were less likely to be published in the peer reviewed literature. Almost all (94%) of industry supported studies, compared to none of the studies funded by sources other than the tobacco industry, claimed a negative economic impact.

These results are consistent with a similar linkage between tobacco industry funding and conclusions in reviews of the effects of secondhand smoke.[114] Barnes and Bero[116] identified 106 reviews of the relation between secondhand smoke and disease. Thirty seven per cent of these reviews concluded that passive smoking was not harmful to health; 74% of these reviews were written by authors with tobacco industry affiliations. Among reviews written by individuals with no industry affiliations, only 13% (10/75) reached the conclusion that passive smoking is not harmful to health. In logistic regression analyses controlling for article quality, peer review status, article topic, and publication year, the only factor associated with concluding that passive smoking is not harmful was whether an author was affiliated with the tobacco industry (odds ratio 88.4; $p < 0.001$).

Table 3 Quality of studies supported by the tobacco industry compared with those that are not

Percent of studies . . .	Industry supported studies	Non-industry studies	Odd ratios (95% CI)	p Value
Including an objective outcome measure	18% (5/31) [57–61]	50% (30/60) [5 25 29 30 33–36 98 113]	5.2 (1.7 to 15.4)	0.003
Meeting all four methodological criteria	0% (0/31)	35% (21/60) [5 25 29 30 34–36 42–46 48 49 51–56 98]	Infinite	
Subject to peer review	3% (1/31) [84]	38% (23/60) [5 35 42 44–49 54 56 63–66 71 72 75–77 98 101 115]	18.5 (2.4 to 142.9)	0.005

CI, confidence intervals.

Table 4 Findings of higher quality studies

	Conclusion of negative impact?			
	Yes	No	χ^2	p Value
Meeting all four Siegel criteria (n=21)	0% (0/21)	100% (21/21) [5 25 29 30 34–36 42–46 48 49 51–56 98]	15.13	0.000
Including an objective measure (n=37)	19% (7/37) [18 27 57–61]	81% (30/37) [5 25 29 30 33–36 98 113]	7.64	0.006
Funded by source clearly independent of the tobacco industry (n=60)	0% (0/60)	100% (60/60) [5 26–28 30 32–36 62–79 98 100–102 109–113 115]	82.38	0.000
Peer reviewed (n=24)	4% (1/24) [84]	96% (23/24) [5 35 42 44–49 54 56 63–66 72 75–77 98 101 115]	14.09	0.000

Table 5 Quality of studies among those that reported a negative impact

	Yes	No	χ^2	p Value
Meeting all four Siegel criteria	0% (0/35)	100% (35/35) [18 23 27 31 57–61 80–97 99 103–108 114]	15.13	0.000
Including an objective measure	20% (7/35) [18 27 57–61]	80% (28/35) [23 31 80–97 99 103–108 114]	7.64	0.006
Funded by source clearly independent of tobacco industry	0% (0/35)	100% (35/35) [18 23 27 31 57–61 80–97 99 103–108 114]	88.80	0.000
Peer reviewed	3% (1/35) [84]	97% (34/35) [18 23 31 57–61 80–97 99 103–108 114]	14.09	0.000

Table 6 Odds ratios for indicators of lower quality among studies with negative conclusions compared to studies not concluding a negative impact

	% finding a negative outcome	% not finding a negative outcome	Odds ratios (95% CI)	p Value
Including only subjective outcome measures	80% (28/35) [23 31 80–97 99 103–108 114]	52% (32/62) [19 20 24 26 28 32 62–79 100–102 109–112 115]	4.0 (1.4 to 9.9)	0.007
Funded by the tobacco industry or a group supported by the tobacco industry	94% (29/31) [23 31 57–61 80–97 103 107 108 114]	4%(2/62) [19 20]	Infinite	0.001
Not being peer reviewed?	97% (34/35) [19 57–61 80–82 85–97 99 102–108 114]	63% (39/62) [19 20 24–26 28–30 32–34 36–41 43 50–53 55 62 67–70 73 74 76 79 100 102 109–113]	20 (2.6 to 166.7)	0.004

The possibility of publication bias always exists. It is possible that studies by those sympathetic to public health goals that detect a negative impact would be less likely to be submitted for publication. On the other hand those funded by the tobacco industry would be similarly unlikely to release studies detecting no negative impact. We have made every effort to identify all studies done on the effects of smoke-free laws and regulations on the hospitality industry. The fact that the tobacco industry has a strong motivation to publicise all negative studies adds to our confidence that we have not missed a substantial number of studies concluding a negative economic impact.

Siegel's criteria are a valuable tool for assessing the quality of studies on the economic impact of smoke-free policies in the hospitality industry. Our findings suggest that policymakers can make a quick preliminary assessment of study quality by asking three questions:

(1) Was the study funded by a source clearly independent of the tobacco industry?

(2) Did the study objectively measure what actually happened, or was it based on subjective predictions or assessments?

(3) Was it published in a peer reviewed journal?

Of the 35 studies on this topic published that concluded a negative impact, none have been funded by a source clearly independent of the tobacco industry, and none have both used an objective measure and been peer reviewed. In fact, 80% of these studies passed none of these basic tests of quality. With all 21 of the well designed studies finding that smoke-free restaurant and bar laws had no negative impact on revenue or jobs, policymakers can act to protect workers and patrons from the toxins in secondhand smoke confident in rejecting predictions that there will an adverse economic impact.

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Studies that Measure the Economic Impact of Smoke-free Policies on the Hospitality Industry

An extensive body of literature shows that smoke-free laws have no negative effect on the hospitality industry. The results of 22 studies involving 12 states are summarized below. The first two review the smoke-free literature in its entirety. The next 20 sources, organized alphabetically by author, look at specific cities or regions of the country and specific sectors of the hospitality industry where smoke-free ordinances have been implemented. Each study is coded to show whether it addresses the effect of smoke-free policy on specific areas of interest, such as restaurants, bars, hotels, revenues, sales tax, employment, tourism, gambling, air quality, and/or public opinion. Much of this research, highlighted in bold type, has appeared in scientifically-published, peer-reviewed journals. State health departments, public universities, and private think tanks have also contributed to the smoke-free literature. After analyzing ordinances from various parts of the country during different economic cycles, these studies have consistently shown that smoke-free laws have not hurt the hospitality industry, and in fact, may even be good for it.

Source	Region	Sector	Results/Description/Conclusion
Scollo, Michelle and Anita Lal (2004). Summary of Studies Assessing the Economic Impact of Smoke-free Policies in the Hospitality Industry. Melbourne: VicHealth Centre for Tobacco Control. http://www.vctc.org.au/tc-res/Hospitalitysummary.pdf.	Summary/Compilation of Smoke-Free Studies		A comprehensive review of scientifically sound studies shows that smoke-free ordinances had no negative effect on the hospitality industry. Researchers examined 145 studies that claimed to analyze the economic impact of smoke-free policies on the hospitality industry. 21 studies were methodologically sound (using objective measures such as sales receipts, controlling for outside factors and trends, using appropriate statistical tests, and including data prior to and following implementation of the smoking ban), and showed that smoke-free policies did not adversely affect the economic health of restaurants and bars. Studies showing a negative economic impact were based on subjective, unverified data and estimates, were methodologically flawed and largely funded by the tobacco industry.
Scollo, M., A. Lal, A. Hyland, and S. Glantz (2003). Review of the Quality of Studies on the Economic Effects of Smoke-Free Policies on the Hospitality Industry. *Tobacco Control* 12: 13-20.	Summary/Compilation of Smoke-Free Studies		A comprehensive review of scientifically sound studies shows that smoke-free ordinances had no negative effect on the hospitality industry. Researchers analyzed 97 studies that focused on the economic impact of smoke-free laws on restaurants, bars, recreational venues, hotels, and tourism. Reviewers assessed these studies based on their overall quality, which included the use of objective data, a pre-/post study design, and statistical methods. The paper concludes that lower quality studies (which used subjective data, received tobacco industry funding, and were not subject to peer-review requirements) were more likely to find a negative association between smoke-free laws and the hospitality industry. In contrast, well-designed, high quality studies found either no impact, or a positive association between smoke-free laws and the hospitality industry's overall sales and employment.

* R=Restaurant, B=Bar, H=Hotel, RV=Revenue, S=Sales Tax, E=Employment, T=Tourism, G=Gambling, AQ=Air Quality, PO=Public Opinion

Bold Type Source = Peer reviewed

Source	Region	Sector*	Results/Description/Conclusion
Bartosch, W.J. and G.C. Pope (2002). Economic Effect of Restaurant Smoking Restrictions on Restaurant Business in Massachusetts, 1992-1998. ***Tobacco Control*** **11(Suppl II): ii38-ii42.**	**Massachusetts** Amherst, Andover, Arlington, Attleboro, Bedford, Belmont, Brookline, Chicopee, East Longmeadow, Easthampton, Foxborough, Greenfield, Holden, Holyoke, Lee, Lenox, Lexington, Longmeadow, Medfield, Montague, Northampton, Norwell, Plainville, Plymouth, Reading, Sharon, South Hadley, Southampton, Stockbridge, Sunderland, Tewksbury, West Springfield	R, S B, RV	Smoke-free laws do not affect overall restaurant sales in the Massachusetts communities included in the analysis. This is a follow-up to a 1999 study and uses additional data to examine the economic effects in cities and towns with and without smoke-free ordinances between January 1992 and December 1998. Seasonal changes and changes in county population and per capita income are the only factors shown to have an effect on restaurant and alcohol revenue.
Bartosch, W.J. and G.C. Pope (1999). The Economic Effect of Smoke-Free Restaurant Policies on Restaurant Business in Massachusetts. ***Journal of Public Health Management Practice*** **5(1): 53-62.**	**Massachusetts** Amherst, Andover, Arlington, Attleboro, Bedford, Belmont, Brookline, Chicopee, East Longmeadow, Easthampton, Foxborough, Greenfield, Holden, Holyoke, Lee, Lenox, Lexington, Longmeadow, Medfield, Montague, Northampton, Norwell, Plainville, Plymouth, Reading, Sharon, South Hadley, Southampton, Stockbridge, Sunderland, Tewksbury, West Springfield	R, S B, RV	Smoke-free laws do not cause a significant change in communities' overall meal and alcohol revenues. Only seasonal changes and changes in a community's population were shown to have an effect on restaurant and bar revenues. Researchers compared aggregate restaurant receipts in 32 Massachusetts communities that adopted smoke-free restaurant and/or bar policies between January 1992 and December 1995 with the receipts of 203 communities that did not.
Centers for Disease Control and Prevention (2004). Impact of a Smoking Ban on Restaurant and Bar Revenues—El Paso, Texas, 2002. ***Morbidity and Mortality Weekly Report*** **53(7): 150-152.**	**El Paso, TX**	R, B, S, RV	Mixed-beverage revenue analyses indicate that sales of alcoholic beverages were not affected by the El Paso smoke-free ordinance. Researchers from the Texas Department of Health (TDH) and the Centers for Disease Control and Prevention (CDC) examined restaurant and bar revenues 12 years before and 1 year after El Paso, Texas enacted its smoke-free ordinance on January 2, 2002. Restaurant, bar, and mixed-beverage revenues varied by quarter (and were found to be highest between the October-December quarter).

* R=Restaurant, B=Bar, H=Hotel, RV=Revenue, S=Sales Tax, E=Employment, T=Tourism, G=Gambling, AQ=Air Quality, PO=Public Opinion
Bold Type Source = Peer reviewed

Source	Region	Sector*	Results/Description/Conclusion
Dai, Chifeng, et al. (2004). The Economic Impact of Florida's Smoke-Free Workplace Law. Gainesville: Bureau of Economic and Business Research, Warring College of Business Administration, University of Florida.	**Florida** Daytona Beach, Ft. Lauderdale, Ft. Myers, Gainesville, Jacksonville, Lakeland Melbourne, Miami, Orlando, Pensacola, Sarasota, Tallahassee Tampa, West Palm Beach	R, B, T, RV, E	Florida's smoke-free law did not negatively impact revenues and employment. Using data from January 1990 to April 2004, the study looks at the economic effect of Florida's smoke-free law on restaurant and bar sales and employment levels within the state's leisure and hospitality industry. Among the six economic measures, three—retail sales from restaurants, lunchrooms and catering services; employment in drinking and eating establishments; and employment in the leisure and hospitality sector—increased after Florida's smoke-free law went into effect. The other measures—retail sales from taverns, night clubs, bars and liquor stores; retail sales from recreational admissions; and employment in accommodations—experienced no change after the law went into effect.
Dresser, J., S. Boles, E. Lichtenstein, and L. Strycker (1999). Multiple Impacts of a Bar Smoking Prohibition Ordinance in Corvallis, Oregon. Eugene: Pacifica Research Institute.	**Corvallis, OR**	B, G, S, RV	Corvallis, Oregon's smoking ban appears to have no economic impact on most bars, with an increase in nonsmokers offsetting a loss in smokers. On July 1, 1998, Corvallis, Oregon required all bars to go smoke-free. Using four data sources (distilled spirits sales, malt liquor sales, video poker sales, and alcohol sales), researchers find that Corvallis' smoke-free ordinance had generally no economic impact on bars. However, the evidence suggests that establishments catering to video poker players did experience a decline in sales. Overall, there appears to be a loss of some smokers to bars outside Corvallis, however, this migration effect was offset by an increase in non-smoking patronage.
Glantz, S.A. (2000). Effect of Smokefree Bar Law on Bar Revenues in California. ***Tobacco Control*** **9(Spring): 111-112.**	**California**	B, RV	Glantz concludes that (1) California's smoke-free restaurant law increased retail sales of eating and drinking establishments, with a larger increase following the enactment of smoke-free bars and (2) the smoke-free restaurant law had no effect on bar revenues for those businesses established solely for the purpose of drinking. Glantz investigates: (1) Whether California's smoke-free restaurant law harmed businesses that were both eating and drinking establishments and (2) Whether California's smoke-free bar law had negative effects on bar revenues. He compares revenues for eating and drinking establishments before and after January 1, 1995, when all restaurants were required to go smoke-free. He also compares bar revenues before and after January 1, 1998, when all bars were required to go smoke-free.

* R=Restaurant, B=Bar, H=Hotel, RV=Revenue, S=Sales Tax, E=Employment, T=Tourism, G=Gambling, AQ=Air Quality, PO=Public Opinion
Bold Type Source = Peer reviewed

Source	Region	Sector*	Results/Description/Conclusion
Glantz, S.A. and A. Charlesworth (1999). Tourism and Hotel Revenues Before and After Passage of Smoke-Free Restaurant Ordinances. *Journal of the American Medical Association* 281(20): 1911-1918.	**California, Utah, Vermont** Boulder, CO; Flagstaff, AZ; Los Angeles, CA; Mesa, AZ; New York, NY; San Francisco, CA	H, RV, T	Smoking bans either increased or had no effect on hotel revenues and tourism. Researchers compared hotel revenues and tourism rates in 3 states and 6 cities. The authors found that smoke-free ordinances increased hotel revenues in 4 localities (Utah; Los Angeles, California; Mesa, Arizona; and New York City, New York), had no effect on revenues in 4 localities (California; Vermont; Boulder, Colorado; and San Francisco, California), and slowed the rate of increase in one city, Flagstaff, Arizona (which, at the time of the investigation, was expanding its hotel stock). Smoke-free ordinances were also shown to increase the number of Japanese tourists who visited California and the number of European tourists who visited New York City. As for the seven remaining locales, no significant changes in tourist rates were observed, either before or after the implementation of smoke-free policies.
Glantz, S.A. and L.R.A. Smith (1997). The Effect of Ordinances Requiring Smoke-Free Restaurants and Bars on Revenues: A Follow-Up. *American Journal of Public Health* (87)10: 1687- 1692.	**Colorado** Aspen, Snowmass, and Telluride **California** Auburn, Beverly Hills, Bellflower, El Cerrito, Lodi, Martinez, Palo Alto, Paradise, Roseville, Ross, Sacramento, San Luis Obispo, Anderson, David, Redding, San Luis Obispo, Tiburon, Shasta Co., Santa Clara Co.	R, B, S, RV	Smoke-free ordinances were found to have no effect on aggregate restaurant or bar sales. Researchers compared sales tax and total retail sales for 15 cities with smoke-free restaurant ordinances against 15 cities without. They also compared bar sales for the first 5 cities (Anderson, CA; Davis, CA; Redding, CA; San Luis Obispo, CA; Tiburon, CA) and 2 counties (Shasta County, CA and Santa Clara County, CA) requiring smoke-free bars with the bar sales of matched cities and counties that did not (Red Bluff, CA; Chico, CA; Healdsburg, CA; Sausalito, CA; Butte County, CA; and Alameda County, CA).

* R=Restaurant, B=Bar, H=Hotel, RV=Revenue, S=Sales Tax, E=Employment, T=Tourism, G=Gambling, AQ=Air Quality, PO=Public Opinion
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Source	Region	Sector*	Results/Description/Conclusion
Glantz, S.A. and L.R.A. Smith (1994). The Effect of Ordinances Requiring Smoke-Free Restaurants on Restaurant Sales. ***American Journal of Public Health*** **(84)7: 1081-1085.**	**Colorado** Aspen, Snowmass, Telluride **California** Auburn, Beverly Hills, Bellflower, El Cerrito, Lodi, Martinez, Palo Alto, Paradise, Roseville, Ross, Sacramento, San Luis Obispo	R, S, RV	This is the first study that used taxable restaurant sales to examine the economic impact of smoke-free laws on business as well as the first study to find that smoking bans generally do not harm restaurants. Researchers compared sales tax and total retail sales for 15 cities with smoke-free ordinances against 15 cities, similar in population, income, and smoking prevalence, where an ordinance was not in force. Among the 15 communities, the data show that restaurant sales from 1986 through 1993 remained unchanged as a fraction of total retail sales. There was some evidence that retail sales to restaurants increased in Bellflower and Martinez, but may have decreased in Roseville. When compared to cities without a smoke-free ordinance, sales also appeared to increase in Palo Alto but decrease in Paradise. It is not clear what factors may have driven these changes.
Glantz, S.A. and R. Wilson-Loots (2003). No Association of Smoke-free Ordinances with Profit from Bingo and Charitable Games in Massachusetts. ***Tobacco Control*** **12: 411-413.**	**Massachusetts** Communities that permitted charitable gaming between 1985 and 2001 (not listed in study)	G, RV	Statistical analysis suggests that observed revenue declines in bingo were not related to community smoking bans. Using annual bingo receipts for the years 1985 through 2001, researchers found that net profits from charitable gaming in Massachusetts fell over time. This trend preceded the passage of local smoke-free ordinances in the state.
Goldstein, A.O. and R.A. Sobel (1998). Environmental Tobacco Smoke Regulations Have Not Hurt Restaurant Sales in North Carolina. ***North Carolina Medical Journal.*** **(59)5: 284-287.**	**North Carolina** Craven Co., Halifax Co., Orange Co., Wake Co., Buncombe Co.	R, RV	The authors conclude that there were no differences in restaurant sales among the ten counties studied in either the period (1990-1993) before smoking bans were implemented or in the period (1994-1997) after. Researchers compared the impact of smoke-free ordinances on restaurant sales in ten North Carolina counties—five which had a smoke-free ordinance (Craven, Halifax, Orange, Wake, and Buncombe) and five that did not (Rockingham, Brunswick, Cabarrus, Mecklenburg, and Davidson).

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Source	Region	Sector*	Results/Description/Conclusion
Hayslett, J.A. and P.P. Huang (2000). Impact of Clean Indoor Air Ordinances on Restaurant Revenues in Four Texas Cities: Arlington, Austin, Plano and Wichita Falls 1987-1999. Bureau of Disease, Injury and Tobacco Prevention. Texas Department of Health.	**Texas** Arlington, Austin, Plano, Wichita Falls	R, S, RV	This study finds that smoke-free ordinances had either no effect or increased restaurant revenues across four Texas cities. Arlington, Austin, Plano, and Wichita Falls, Texas implemented smoke-free restaurant ordinances in July 1994, March 1996, August 1995, and July 1995, respectively. These four cities have different geographies in the state, as well as different economies. Researchers examined thirteen years (1987-1999) of restaurant and retail sales data to look at the effect of smoke-free ordinances on the economic health of these cities. For Plano and Wichita Falls, the smoking ban had no impact on restaurant revenues. For Arlington and Austin, the smoke-free ordinance was associated with an increase in restaurant revenues. With respect to restaurant revenue as a proportion of total retail revenue, the smoke-free ordinance was found to have no effect in Austin, Plano, and Wichita Falls. In Arlington, the smoking ban was shown to increase the city's restaurant sales as a proportion of total retail revenue.
Huang, P., et al. (1995). Assessment of the Impact of a 100% Smoke-Free Ordinance on Restaurant Sales—West Lake Hills, Texas, 1992-1994. *Morbidity and Mortality Weekly Report* 44(19): 370-372.	**West Lake Hills, TX**	R, RV	The study concludes that there were no adverse economic effects associated with West Lake Hills' smoke-free ordinance. On June 1, 1993, West Lake Hills, Texas implemented a smoke-free ordinance requiring all commercial establishments, including restaurants and restaurants with bars, to be 100 percent smoke-free. Researchers examined aggregate monthly sales from 7 restaurants before and after the ban.
Hyland, A. and J. Tuk (2001). Restaurant Employment Boom in New York City. *Tobacco Control* 10(Summer): 199.	**New York City, NY** (Bronx, Brooklyn, Manhattan, Queens, Staten Island) Nassau Co., Westchester Co., Rockland Co.	R, E	This study finds no decrease in restaurant employment following the passage of New York City's smoke-free ordinance. Researchers compared the number of restaurant employees per month between April 10, 1994, one year before NYC required all smoke-free restaurants, and April 10, 1999, four years after the law's implementation. In addition to looking at employment data for the city's five boroughs—Bronx, Brooklyn, Manhattan, Queens, and Staten Island—researchers also included the nearby counties of Nassau, Westchester, and Rockland. They conclude that more than 22,000 restaurant employees were employed in NYC four years post-ban; this was an 18 percent increase from 1990. While all five boroughs experienced an increase in restaurant employment, Bronx and Richmond counties outpaced other regions at 36 percent and 31 percent, respectively.

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Source	Region	Sector*	Results/Description/Conclusion
Hyland, A. and K.M. Cummings (1999). Restaurateur Reports of the Economic Impact of the New York City Smoke-Free Air Act. ***Journal of Public Health Management Practice*** **5(1): 37-42.**	**New York City, NY** Bronx, Brooklyn, Manhattan, Queens, Staten Island	R, PO	After randomly surveying 434 New York City restaurateurs, researchers determined that New York City's Smoke-Free Air Act had no effect on restaurant sales. 34 percent of smaller restaurants and 36 percent of restaurants with bar areas reported a decline in business compared with 35 percent of larger restaurants and restaurants without bar areas reporting similar results.
Hyland, A. and K.M. Cummings (1999). Restaurant Employment Before and After the New York City Smoke-Free Air Act. ***Journal of Public Health Management Practice*** **5(1): 22-27.**	**New York City, NY** Bronx, Brooklyn, Manhattan, Queens, Staten Island Nassau Co., Westchester Co., Suffolk Co.	R, E	New York City's smoking ban was not shown to affect employment in or the growth of the city's hospitality industry. Researchers looked at the number of restaurants and restaurant employees in New York City (comprised of the five boroughs of Manhattan, Bronx, Richmond, Kings, and Queens), three nearby counties (Nassau, Westchester, and Suffolk) and the rest of the state using data from two years before and after the passage of New York City's Smoke-Free Air Act. Between April 1993 and April 1997, New York City, as well as the rest of the state, experienced increases in both the numbers of restaurants and restaurant employees. New York City's restaurant employment growth was found to be more than three times that of the entire state. Brooklyn was the only county to show a decrease in both restaurants and employment, however, Brooklyn also lost population during the study period, making a decline in overall restaurant and restaurant employees likely.
Hyland, A., K.M. Cummings, and E. Nauenberg (1999). Analysis of Taxable Sales Recipts: Was New York City's Smoke-Free Air Act Bad for Restaurant Business? ***Journal of Public Health Management Practice*** **5(1): 14-21.**	**New York City, NY** Brooklyn, Bronx, Manhattan, Queens, Staten Island	R, H, S	Researchers conclude that New York City's smoke-free law did not change sale revenues at restaurants and hotels. This study measures the level of taxable sales receipts before and after the implementation of New York City's Smoke-Free Air Act on April 10, 1995.
New York City Department of Finance, New York City Department of Health and Mental Hygiene, New York City Department of Small Business Services, and New York City Economic Development Corporation (2004). The State of Smoke-Free New York City: A One Year Review.	**New York City, NY** Brooklyn, Bronx, Manhattan, Queens, Staten Island	R, B, S, E, AQ, PO	This study suggests that New York City's smoke-free law has not hurt the hospitality industry, and that New Yorkers approve of the ban. Researchers looked at the effect of New York City's Smoke-Free Air Act, enacted March 30, 2003, on the city's employment and its restaurant and bar sales. Since the law went into effect, employment in the city's restaurants and bars increased by 10,600 jobs while sales tax receipts increased 8.7%, or nearly $1.4 million. While the number of restaurants and bars did not change, there was a 4% increase in the number of new liquor licenses issued. Moreover, 69% of registered NYC voters approved of the smoking ban.

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Sciacca, J.P. and M.I. Ratliff (1998). Prohibiting Smoking in Restaurants: Effects on Restaurant Sales. *American Journal of Health Promotion* 12(3): 176-184.	**Flagstaff, AZ**	R, H, T, S, RV	Flagstaff, Arizona's smoking ban had no effect on the city's tourism. The authors compared restaurant, motel and hotel sales data three-and–a-half years before Flagstaff's smoke-free restaurant law and one-and-a-half years after its enactment. In comparison to Prescott, Yavapai County, Yuma, Yuma County, and the state of Arizona, Flagstaff's motel and hotel sales did not change before or after the ordinance.
Styring, W. III (2001). A Study of the Fort Wayne (IN) Restaurant Smoking Ban: Has It Impacted the Restaurant Business? Indianapolis: Hudson Institute.	**Fort Wayne, IN**	R, S, PO	Fort Wayne, Indiana's smoke-free ordinance, enacted in January 1999, had no effect on food and beverage tax revenues. Styring, a researcher for a prominent, conservative think-tank, looked at the levels of Allen County tax revenue before and after the ban. He concluded that changes in Allen County Personal Income explained over 96 percent of the change in food and beverage tax collections. Styring followed up his statistical analysis with a telephone survey of 250 Allen County residents. Of the 238 residents who said they were aware of Fort Wayne's smoking ban, 164 (69%) said it made no difference in their decision to patronize a restaurant; 39 (16%) said the ban made it less likely and 35(15%) said the ban made it more likely that they would patronize a restaurant.

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